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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/336,392	06/18/1999	TERRENCE R. GREEN	25658-0002	7579

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EXAMINER	
CHOI, FRANK I	

ART UNIT	PAPER NUMBER
1616	

DATE MAILED: 10/20/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/336,392	GREEN ET AL.	
	Examiner	Art Unit	
	Frank I Choi	1616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on 7/22/2004.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 61,62,64-76 and 99-114 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 61,62,64-76 and 99-114 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 101/ 112

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 61,62,64-76 and 99-116 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant has not cited to anywhere in the Specification which supports the incorporation of reactants from body fluids into the device as part of the claimed device. The only section cited discloses the use of the device wherein the substances necessary to cause production of the oxidant come from bodily fluids which react with the components in the device to produce the oxidant. However, the reactants in the bodily fluids are not disclosed as being

part of the device itself. In fact, the section cited by Applicant indicates that said reactants are absent from the polymeric matrix and the device is stable, i.e. does not produce the oxidant, until contacted by body fluid (Pg. 11, paragraph 3, line 3-10).

Claims 61,62,64-76 and 99-113 rejected under 35 U.S.C. 112, first paragraph, as based on a disclosure which is not enabling. Method of incorporating enzymes into thermoplastic or thermosetting polymers and formulation in which mere wetting of device activates oxidase critical or essential to the practice of the invention, but not included in the claim(s) is not enabled by the disclosure. See *In re Mayhew*, 527 F.2d 1229, 188 USPQ 356 (CCPA 1976). Applicant's specification specifically states that room temperature vulcanization elastomers must be used in fabricating the device from hydrophobic polymers since enzymes will denature (Pgs. 31, 32). The claims require the use of thermoplastic or thermosetting polymers (See Claim 61). However, the claims also can include as proton donor or oxidizing agent an oxidase. There does not appear to be any disclosure which shows how the oxidase can be incorporated in view of the prohibition against their use as indicated above. Applicant's specification indicates that with respect to glucose oxidase, the fluids must contain glucose and that even exposure to water does not release the oxidant (Pgs. 39,40) (Examiner notes that the same applies to other oxidases which require the presence of a substrate for activation). There does not appear to be a disclosure which shows how said oxidases can be activated by simply wetting the device absent presence of the appropriate substrate in view of the above.

Examiner has duly considered Applicant's arguments but deems them unpersuasive.

Applicant cites to various sections of the Specification but does not indicate how said disclosures overcome the rejection herein in that said disclosures do no overcome the prohibition against use of enzymes with thermosetting and thermoplastic polymers.

Claims 61,62,64-76 and 99-116 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the specific oxidant with the appropriate oxidizing agent, reducing agent and proton donating agent as disclosed in the Specification, and the disclosed processes of fabricating the devices does not reasonably provide enablement for oxidants, oxidizing agents and reducing agents or proton donating agents, where the disclosure is silent as to the appropriate combination of said agents or devices made by other process. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention commensurate in scope with these claims.

The nature of the invention:

The invention is directed to the claimed anti-infective medical device made from a matrix of polymers including thermosetting or thermoplastic polymers in which the matrix contains as solid particles an oxidant-generating formulation comprising oxidizing agent and reducing agent that when wetted generates the oxidant, which can further contain a proton donor agent.

The state of the prior art and the predictability or lack thereof in the art:

The prior art of record does not appear to set forth oxidant-generating formulations different from that set forth in the specification. Further, Applicant's specification setforth what appears to be critical fabrication processes as set forth in the 112 first paragraph rejection above and 112 second paragraph rejection below. As such predictability in the art appears to be low

with respect to the appropriate combinations of oxidants, oxidizing agents, reducing agents and/or proton-donors and fabrication processes other than which is set forth in the disclosure.

The amount of direction or guidance present and the presence or absence of working examples:

The amount of direction or guidance and working examples appears to be largely limited to iodine generating formulations and the appriopriate oxidizing agents, reducing agents and proton donors for ioding generating formulations. There is some discussion of possible other oxidants, namely hydrogen peroxide, nitric oxide, hydroxy radical , hypohalites, haloamines, thiocyanogen and hypothiocyanite and the approprate generating agents for the same. However, it is clear from the disclosure on pgs. 44-46, that not all the oxidant-generating formulations include or even mention the presence of both oxidizing agents and reducing agents, or proton donors in the formulation. Examiner acknowledges that the contacting fluids may contain one or more of the appropriate compounds necessary for the production of the oxidant, however, the claims require the presence of both an oxidizing agent and reducing agent and in some dependent claims a proton donating agent in the formulation itself. With respect to fabrication of the devices, the specification sets forth what appears to be critical fabrication processes as set forth in the 112 first paragraph rejection above and 112 second paragraph rejection below.

The breadth of the claims and the quantity of experimentation needed:

The claims are broad in that they claim any reactant from body fluids, proton donor and do not set forth the process by which the device is fabricated. It appears, in light of the above, that one of ordinary skill in the art would be required to do undue experimentation, i.e. to determine the appropriate reducing agent, i.e. reactant from body fluids, and proton donor for the

specific oxidant, depending on type of polymer used for the matrix, and what other fabrication process would be suitable to form the claimed invention depending on the components of the claimed invention, other than what is set forth in the specification, in order to make and/or use the invention commensurate in scope with the claims.

Examiner has duly considered Applicant's arguments but deems them unpersuasive.

The claims as now amended indicate that the reducing agent can now include reactants produced by body fluids. However, Applicant has made no showing that the reactants from body fluids without the oxidase will result in production of the oxidant. Further, Applicant has made no showing as to what compounds, compositions, etc. are encompassed by limitation "reactants provided by body fluids" and what reactant in the body fluid is appropriate as a reducing agent for the specified oxidizing agent. As such, one of ordinary skill in the art would not know what reactant to use from the body fluid to be incorporated into the device other than what the Specification discloses reacts with the oxidases in the device. Further, Applicant does not show how the sections cited from the Specification relate to or overcome the disclosures in the Specification which appear to be essential to invention as set forth above and below.

Claims 61,62,64-76 and 99-116 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: (1) mixing finely ground particles of the oxidant producing compound in to the polymer prior to its curing and/or fabrication, as a coating, or as a device, of specific dimensions and configuration (Pg. 26); (2) for hydrophobic polymers, fabrication of the inventive device requires that the oxidant-generating formulation first is ground to a fine powder of 200 microns or less, which dry formulation is then mechanically

mixed at room temperature (20 to 25 degrees Celsius) in to a hydrophobic elastomer; (3) for formulations encapsulating enzymes, room temperature vulcanization elastomers must be used (Pg. 31); (4) for hydrophilic polymers, the oxidant formulations must first be premixed at low termperatures near the freezing point of water; (5) for oxidases, the required substrate must be present (pgs. 39,40); (6) critical fabrication steps of the hydrogel device include prechilling the gel-forming solution to less than 4 degrees celcius but not below freezing temperatures, adding and mixing in an oxidant generating.formulation in the gel solution, casing the mixture into a mold and rapidly freezing and lyophilizing the mixture, alternatively instead of a mold that product can be formed into sheets (Pgs. 40,41).

Examiner has duly considered Applicant's arguments but deems them unpersuasive.

Applicant cites to various sections of the Specification, however, Applicant provides no explanation as to how said disclosures indicate that the above items are not essential to the claimed invention.

Claims 66,69, 105 recites the limitation "alkali iodate salts". There is insufficient antecedent basis for this limitation in the claim as the claim on which they are dependent require that said salts be "anhydrous" whereas the limitation is broader in scope. Examiner suggests that "anhydrous" be added to the limitation.

Claims 61, 62,64,68-76, 99,100, 104-114 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A single claim which claims both a product and the method steps of using the product is indefinite under 35 U.S.C. 112, second paragraph. See MPEP 2173.05(p)(II). Said claims are

also rejected under 35 U.S.C. 101 as the claims are directed to neither a "process" nor a "composition," but rather embraces or overlaps two different statutory classes of invention set forth in 35 U.S.C. 101 which is drafted so as to set forth the statutory classes of invention in the alternative only. See MPEP 2173.05(p). In this case, the claims recite that the reducing agent is reactants provided by body fluids. As such, in order for the device to contain the reactants the device has to be implanted, as such, the claim contains both product and the method steps of using the product.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 61, 62, 64-66, 70, 99-102, 106,114 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Trescony et al. (US Pat. 5,994,444).

Trescony et al. expressly discloses a medical device comprising a polymeric material selected from polylactic acid, polyglycolic acid and copolymers thereof, having inorganic nitrite dispersed therein which in the presence of biological fluids yields an acid and reducing agent which generated nitric oxide, where the devices includes a stent or catheter or lead falling within

the scope of applicant's claims, where when the reducing agent is potassium iodide, iodine is also produced (See Column 5, lines 23-68, Column 6, lines 1-15, claims 1-27).

Alternatively, at the very least the claimed invention is rendered obvious within the meaning of 35 USC 103, because the prior art discloses products and uses that contain the same exact ingredients/components as that of the claimed invention. See In re Fitzgerald, 205 USPQ 594 (CCPA 1980). See also In re May, 197 USPQ 601, 607 (CCPA 1978).

Examiner has duly considered Applicant's arguments but deems them unpersuasive. Applicant argues that nitrogen oxide would not be effective as an anti-infective. However, the article cited by Applicant does discloses that NO inhibits the growth of many bacteria and parasites. The fact the antimicrobial effect results from the oxidation of NO does show that the prior art product is not anti-infective. Applicant's own Specification discloses that embodiments of its device are stable, i.e. do not produce the anti-infective oxidant until contacted by bodily fluids. All that the article cited by Applicant indicates is that NO undergoes oxidation when introduced to the microbe which results in the formation of intermediates which inactivate key microbial enzymes. Applicant's arguments set forth the amounts produced by the prior art composition, however, Applicant does not provide sufficient evidence which supports the conclusion that said amounts will not have any anti-infective effect.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

A facsimile center has been established in Technology Center 1600. The hours of operation are Monday through Friday, 8:45 AM to 4:45 PM. The telecopier number for accessing the facsimile machine is (703) 872-9306.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Choi whose telephone number is (571)272-0610. Examiner maintains a flexible schedule. However, Examiner may generally be reached Monday-Friday, 8:00 am – 5:30 pm (EST), except the first Friday of the each biweek which is Examiner's normally scheduled day off.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's Supervisor, Mr. Gary Kunz, can be reached at 571-272-0887. Additionally, Technology Center 1600's Receptionist and Customer Service can be reached at (571) 272-1600.

FIC
October 18, 2004

JOHN PAK
PRIMARY EXAMINER
GROUP 1600